



TEACHERS' GAMIFICATION OF CLASSROOM INSTRUCTIONS FOR SECONDARY EDUCATION GOALS ATTAINMENT IN RIVERS STATE, NIGERIA

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Abstract:

The study investigated teachers' gamification of classroom instructions for secondary education goals attainment in Rivers State. There were five research questions answered in the study. The design adopted for the study was descriptive survey. The population of the study comprised 6,956 teachers which was 3,536 males and 3,420 females while the sample of the study was 717 teachers comprising 359 males and 358 females and they were selected using simple random sampling technique. The instrument used for collection of data was a 25 items questionnaire. The instrument was validated by two experts in Measurement and Evaluation from the Department of Educational Psychology, Guidance and Counselling, University of Port Harcourt. The reliability of the instrument was 0.91 using Cronbach Alpha statistics. Out of the 717 copies of questionnaire administered, 698 copies which was 93.4% were retrieved comprising 345 male and 353 female. Mean and standard deviation were used to answer the research questions. The result of the study indicated that teachers had the right perception on gamification, utilized computer games for teaching but do not adhere to relevant approaches, design principles and this was as a result of challenges which included lack

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of expertise in the use of these games. It was recommended that teachers should be trained in the areas of gamification for the goals of secondary education to be achieved in Rivers State.

Keywords: gamification, classroom instruction, secondary education, goals attainment, Rivers State

1. Introduction

Secondary education is known all over the world as one of the levels of education that contributes the most to the success of any society. This is because this level of education helps to bridge the gap between educational activities at the primary and tertiary levels. The Federal Republic of Nigeria (2013) clarified this position through the national policy on education by specifying among others; that the objectives of secondary education will include to prepare students for higher level learning, provide middle level manpower, developing a sense of national consciousness and promoting unity. These goals are instrumental to the growth and development of both the learner and the society at large. Due to the strategic nature of secondary education in the educational system of any nation, stakeholders provide essential resources to ensure that the goals and objectives of this level of education are not jeopardized. Parents, teachers, government among others commit huge resources to the success of secondary education. However, despite this huge investment, the quality of output from this level of education has not justified the quality and quantity of resources invested into the education system. This has necessitated various reforms at this level of education. Furthermore, the lopsided educational performance of secondary school students in internal and external examinations in Rivers State has drawn more attention to the need for intervention at this level of education. Educational scholars have carried out series of studies to investigate the quality of teaching and learning interaction between teachers and students and how it affects the attainment of the goals and objectives of secondary education across the country. However, one area of concern which has remained unattended to is the quality of instructional materials used to transmit instructional knowledge in these schools particularly the use of games as a means of instructional delivery which has become a 21st century practice for the attainment of educational goals and objectives in several developed counties.

The use of games for transmitting classroom instruction is a fairly new practice especially in developed countries. The act of using games in a non-game context is referred to as gamification. This implies the use of games to engage students in meaningful teaching and learning activities especially in a situation where games are not originally required. This practice is often used to allow learners have a real life experience of the abstract knowledge that is often transmitted in the classroom during teaching and learning. However, Shanahan, Hermans and Haytko as cited in Kirkland and O'Riordan (2010) pointed out that in the process of gamification, certain factors must be put into

consideration by the teacher if the goals of education must be achieved and this includes that the game must relate to the learning objectives being pursued, the teacher as well as the students must not find it difficult to learn how to play the game, the game should not become more important than the learning, the game must be a motivator for students to learn and it must allow for feedback between the teacher and the students. It is only when these conditions are met that the process of gamification can become successful in meeting outlined educational goals and objectives.

Teachers in a contemporary classroom used games for instructional delivery because it is very relevant in the attainment of educational goals. Scholars such as Lacasa as cited in Papadakis (2018:5) pointed out that there are games which can be used for meeting educational goals which focus on adventure, strategic reasoning, sports, taking action, simulation and role playing among others. Therefore, it can be deduced that there is no educational goal that cannot be actualized with the use of games especially at the secondary level of education. However, the teacher must have the right opinion or perception about this practice before it can be meaningfully engaged and used to achieve outlined educational goals and objectives. The perception of teachers in gamification is therefore important for educational goals and objectives to become actualized.

Teachers in secondary schools need to understand that they have a lot to benefit and achieve from the use of games in the teaching and learning process. This includes the ability to motivate the leader, promote collaboration as well as enhance conventional teaching practices (Katmada, Mavridis, & Tsiatsos, 2014). Similarly, Woo (2014) equally pointed out that using games to learn promotes cognitive abilities and performance and as such teacher's perception and acceptance of gamification techniques is crucial for effective completion of the course requirements. The perception of the teacher is therefore measured by the extent to which they engage this practice, share the idea with colleagues as well as make effort to improve the practice for the goals and objectives of education in and outside the classroom to be achieved.

There are different types of games that teachers can use in the classroom in the process of gamification for the goals of secondary education to be achieved. In the past, traditional games are often used in traditional classroom settings for teaching and learning activities. Similarly, in recent times, traditional games are often engaged in teaching art related courses as well as subjects with the intention of promoting culture. The type of game used in the classroom therefore depends on the educational objective that is to be achieved. On their part, Shaw as cited in Kirkland and O'Riordan (2010) clarified that traditional board games such as scrabble are often used to teach languages while monopoly is used to teach the principles of capitalism and socialism. All of these games are used to achieve specific objectives which make teaching easy, fun and efficient. In recent times, different computer games have also been developed to meet different educational objectives. This is in addition with other non-computer based games, field games among others which are all geared towards making educational meaningful and productive.

The successful use of games for meeting the goals of education hinges on the teachers understanding of the principles guiding the design of these games. There are design principles which make gamification meet outlined educational goals and objectives. These principles as outlined by different education scholars are that the games must be built in platforms that can survive in any environment, must be able to meet different level of learning complexities, must possess different features which can be easily controlled by the instructor, it must promote cooperation and competitiveness, it must be able to provide feedback among other principles. Teachers must have understanding of these principles in order to avoid making mistakes that can negatively affect the essence of gamification in and outside the classroom.

Since the teacher alone cannot guarantee a smooth gamification process, the teacher must be able to engage the right approach to ensure that students acquire the right level of skill and knowledge from this practice. There are several approaches that the teacher can engage to encourage gamification in the school. Mohamad, Sazali and Salleh (2017) pointed out that the teacher should be able to put the characteristics of the learner into consideration as well as consider all legal and ethical issues surrounding the use of the game being used in the classroom. In addition to this, the teacher must make all effort to source for other support resources which will make the gamification process successful. The approach engaged by the teacher will help to ensure that intended objectives are fully and rightly achieved. Similarly, in engaging the right approach, the teacher must be able to structure the teaching and learning experience in an orderly manner such that everyone will be satisfied with the quality of instruction delivered using this procedure.

Gamification of classroom instruction does not come without challenges which can hinder its goal and objectives. The teacher must therefore be ready to address these challenges for the success of this process. Challenges which are likely to arise includes the shortage of game equipment and other support resources, this is in addition with dealing with the complexity of using some of these games. Similarly, some of these games also have mental, emotional and physical defects which may arise from their usage. These among others are challenges that the teacher must be ready to surmount in the process of gamification for the attainment of the goals and objectives of education especially at the secondary level of education. This comes with lots of benefits such as the development of the right level of skills, knowledge, development of acceptable attitude which in the long run will promote students' performance as well as teaching efficiency and effectiveness.

2. Purpose of the Study

The aim of the study was to investigate teachers' gamification of classroom instruction for secondary education goals attainment in Rivers State. In specific terms, the objectives of the study were to:

- 1) ascertain teachers' perceptions about the gamification of classroom instruction for secondary education goals attainment in Rivers State.
- 2) identify the type of games used by teachers for secondary education goals attainment in Rivers State.
- 3) examine the design principles engaged by teachers in the gamification of classroom instructions for secondary education goals attainment in Rivers State
- 4) determine the strategies for encouraging gamification for secondary education goals attainment in Rivers State.
- 5) find out the challenges in the gamification of classroom instruction for secondary education goals attainment in Rivers State.

2.1 Research Questions

The following research questions were answered in the study:

- 1) What are teacher's perceptions about the gamification of classroom instructions for secondary education goals attainment in Rivers State?
- 2) What are the types of games used by teachers for secondary education goals attainment in Rivers State?
- 3) What are the design principles engaged by teachers in the gamification of classroom instructions for secondary education goals attainment in Rivers State?
- 4) What are the strategies for encouraging gamification for secondary education goals attainment in Rivers State?
- 5) What are the challenges in the gamification of classroom instruction for secondary education goals attainment in Rivers State?

3. Methodology

Descriptive survey design was adopted for the study since the study was for the purpose of investigating an existing phenomenon. Population of the study was 6,956 teachers comprising 3,536 males and 3,420 females. Taro Yamane formula was used to determine the sample size of the study and this gave a sample size of 717 teachers (359 males and 358 females). Simple random sampling technique will be used to draw the sample for the study. The instrument used for data collection was a 25-items questionnaire titled "Gamification of Classroom Instruction for Secondary Education Goal Attainment Questionnaire" (GCISEGAQ). The instrument was validated by two experts in Measurement and Evaluation from the Department of Educational Psychology, Guidance and Counselling, University of Port Harcourt. Cronbach Alpha was used to determine the reliability of the instrument with an index of 0.91 which was considered adequate for the study. The instrument was administered by the researcher with the assistance of four Research Assistants with a 93.4% return rate (698 copies returned; 345 male and 353 female) while mean and standard deviation were used to answer the research questions.

4. Results and Discussion

4.1 Answer to Research Questions

Research Question One: What are teacher's perceptions about the gamification of classroom instructions for secondary education goals attainment in Rivers State?

Table 1: Mean and standard deviations scores on teacher's perceptions about the gamification of classroom instructions for secondary education goals attainment in Rivers State

S/No	Items	Male Teachers n=345		Female Teachers n=353		Mean Set	
		Mean \bar{X}_1	SD	Mean \bar{X}_2	SD	$X \bar{X}$	Decision
1	Gamification helps promote retention of knowledge	2.82	0.65	2.90	0.72	2.86	Agreed
2	There is improved cognitive abilities and critical thinking	2.70	0.67	2.62	0.63	2.66	Agreed
3	Socialization is enhanced from the practice of gamification	2.55	0.62	2.72	0.60	2.64	Agreed
4	Completion of course content is made easy through gamification	2.61	0.59	2.64	0.59	2.63	Agreed
5	Students motivation to learn is promoted	2.58	0.66	2.81	0.69	2.70	Agreed
Grand Mean and Standard Deviation		2.65	0.64	2.74	0.65	2.70	Agreed

It was revealed in Table 1 that the responses of the male teachers to items 1-5 produced mean scores of 2.82, 2.70, 2.55, 2.61 and 2.58 and all of these items were above the criterion mean score of 2.50 used for decision making and implied that they were agreed in response to the questions raised. On the part of the female teachers, the same set of items produced mean scores of 2.90, 2.62, 2.72, 2.64 and 2.81 and were also agreed for being above the criterion mean score of 2.50 used for decision making. In summary, the average mean score of 2.70 showed that the respondents agreed on teacher's perceptions about the gamification of classroom instructions for secondary education goals attainment in Rivers State.

Research Question Two: What are the types of games used by teachers for secondary education goals attainment in Rivers State?

Table 2: Mean and standard deviations scores on the types of games used by teachers for secondary education goals attainment in Rivers State

S/No	Items	Male Teachers n=345		Female Teachers n=353		Mean Set	
		Mean \bar{X}_1	SD	Mean \bar{X}_2	SD	$X \bar{X}$	Decision
6	Teachers often used traditional games for instructional delivery	2.49	0.68	2.56	0.59	2.53	Agreed
7	Computer games are basically used for gamification	2.72	0.66	2.71	0.62	2.72	Agreed

8	Teachers are more comfortable using field games	2.47	0.71	2.49	0.73	2.48	Disagreed
9	Track games are commonly used for teaching	2.45	0.77	2.49	0.73	2.47	Disagreed
10	Other games are more relevant in teaching	2.46	0.69	2.40	0.78	2.43	Disagreed
Grand Mean and Standard Deviation		2.52	0.70	2.53	0.69	2.52	Agreed

In Table 2, the responses of male teachers to items 6, 7, 8, 9 and 10 showed that only item 7 had mean score of 2.72 which was above the criterion mean score of 2.50 used for decision making while the other items were below the criterion mean score and implied that they were disagreed in response to the items raised. On the part of the female teachers, the same set of questions showed that only items 6 and 7 with mean scores of 2.56 and 2.71 were agreed for being above the criterion mean score while the remaining items were disagreed. Summarily, the average mean score of 2.52 implied that the teachers averagely agreed on the types of games used by teachers for secondary education goals attainment in Rivers State.

Research Question Three: What are the design principles engaged by teachers in the gamification of classroom instructions for secondary education goals attainment in Rivers State?

Table 3: Mean and standard deviations scores on the design principles engaged by teachers in the gamification of classroom instructions for secondary education goals attainment in Rivers State

S/No	Items	Male Teachers n=345		Female Teachers n=353		Mean Set	
		Mean \bar{X}_1	SD	Mean \bar{X}_2	SD	$X \bar{X}$	Decision
11	The game should adapt to different educational purpose	2.54	0.68	2.67	0.76	2.61	Agreed
12	It should be able to achieve the desired level of learning complexity	2.50	0.69	2.49	0.61	2.50	Agreed
13	Game should allow users to control features available	2.57	0.63	2.18	0.63	2.38	Disagreed
14	The game should be able to promote competitiveness and cooperation	2.49	0.74	2.24	0.73	2.37	Disagreed
15	Teacher should be able to get feedback from the game	2.54	0.68	2.65	0.74	2.60	Agreed
Grand Mean and Standard Deviation		2.53	0.68	2.45	0.69	2.49	Disagreed

Table 3 revealed the responses of the male and female teachers to items 11, 12, 13, 14 and 15 respectively. The responses of the male teachers were all agreed since the mean scores

were all above the criterion mean score of 2.50 used for decision making except for item 14 which was disagreed with a mean score of 2.49. The responses of the female teachers showed that items 13 and 14 with mean scores of 2.18 and 2.24 were disagreed while the other items with higher mean scores above 2.50 were agreed. The average mean score of 2.49 in summary implied that the respondents disagreed on the design principles engaged by teachers in the gamification of classroom instructions for secondary education goals attainment in Rivers State.

Research Question Four: What are the approaches for encouraging gamification for secondary education goals attainment in Rivers State?

Table 4: Mean and standard deviations scores on the approaches for encouraging gamification for secondary education goals attainment in Rivers State

S/No	Items	Male Teachers n=345		Female Teachers n=353		Mean Set	
		Mean \bar{X}_1	SD	Mean \bar{X}_2	SD	\bar{X}	Decision
16	Characteristics of learner is considered in instructional planning	2.43	0.78	2.60	0.71	2.52	Agreed
17	Learning objectives are considered strategically	2.53	0.69	2.50	0.75	2.52	Agreed
18	Legal and ethical issues are put into consideration for the process to succeed	2.43	0.61	2.47	0.77	2.45	Disagreed
19	Identifying the right resources to be used for teaching	2.54	0.65	2.50	0.75	2.52	Disagreed
20	Structuring of learning experiences in an order is fundamental	2.46	0.64	2.44	0.78	2.45	Disagreed
Grand Mean and Standard Deviation		2.48	0.67	2.50	0.75	2.49	Disagreed

It was revealed in table 4 that the responses of the male teachers produced mean scores of 2.43, 2.53, 2.43, 2.54 and 2.46 while the female teachers responded with the same set of items with mean scores of 2.60, 2.50, 2.47, 2.50 and 2.44. All the items with mean scores above 2.50 were considered agreed in response to the items raised while the remaining items with mean scores below the criterion mean score of 2.50 were considered otherwise. In summary, the average mean score of 2.49 indicated that the respondents disagreed on the approaches for encouraging gamification for secondary education goals attainment in Rivers State.

Research Question Five: What are the challenges in the gamification of classroom instruction for secondary education goals attainment in Rivers State?

Table 5: Mean and standard deviations scores on the challenges in the gamification of classroom instruction for secondary education goals attainment in Rivers State

S/No	Items	Male Teachers n=345		Female Teachers n=353		Mean Set	
		Mean	SD	Mean	SD	X	Decision
		\bar{X}_1		\bar{X}_2		\bar{X}	
21	The shortage of game resources constitutes a challenge	2.62	0.62	2.67	0.78	2.655	Agreed
22	Side effect of some games make it difficult for gamification to be practiced	2.66	0.75	2.53	0.61	2.60	Agreed
23	Gamification is not a flexible learning process	2.62	0.62	2.57	0.60	2.60	Agreed
24	There are no policies guiding the gamification of classroom instructions in secondary schools	2.63	0.76	2.63	0.74	2.63	Agreed
25	The teacher and learners are not prepared for this kind of learning process	2.65	0.55	2.63	0.74	2.64	Agreed
Grand Mean and Standard Deviation		2.64	0.66	2.61	0.69	2.62	Agreed

Table 5 indicated that the responses of the male teachers as well as the female teachers produced mean scores of 2.62, 2.66, 2.62, 2.63 and 2.65 as well as 2.67, 2.53, 2.57, 2.63 and 2.63 respectively. All of these items were above the criterion mean score of 2.50 used for decision making and as such were agreed in response to the items raised. In summary, the average mean score of 2.62 implied that the respondents agreed on the challenges in the gamification of classroom instruction for secondary education goals attainment in Rivers State.

5. Discussion of Findings

5.1 Teacher's Perceptions about the Gamification of Classroom Instruction for Secondary Education Goals Attainment in Rivers State

The study showed that the respondents agreed on the perception of teachers on the gamification of classroom instruction for the attainment of secondary education goals in Rivers State. This study was however at variance with the outcome of a similar study conducted by Alabbasi (2018) which showed that teachers felt that gamification affected students negatively. This implies that teachers have different opinion on the relevance of gamification as a means of attaining the goals of secondary education. This may be the reason why gamification has not been fully embraced across all secondary schools in Rivers State.

In this study, the teachers sampled for the study agreed that gamification helps to promote retention among students and also contributes to student's ability to engage in critical thinking. Based on this finding, it is clear that teachers have a lot to do with the success of the gamification process. Their opinion about the relevance of the use of games

for teaching and learning will influence their willingness to use these educational resources. It is also important for school administrators to make policies that will compel teachers to make use of games during teaching as this will go a long way to compel teachers to use these devices for teaching and learning.

5.2 Type of Games used by Teachers for Secondary Education Goals Attainment in Rivers State

Teachers sampled for this study jointly revealed that they make use of computer games for instructional delivery more than other types of game such as traditional game and other non-computer games. This finding aligns with the result of a similar study conducted by Rastegarpour and Marashi (2012) which showed that teachers consider computer games more for teaching than other traditional games. The reason for this may not be far from the fact that computer games are often handy and readily available for teaching and learning more than other games that will require the gathering of relevant resources before they can be enforced.

Other games which can be used for instructional delivery such as traditional games were equally agreed to be used for teaching and learning. This may not be unconnected with the fact that some learning objectives cannot be achieved without engaging traditional games. Traditional games are also fun to practice and providing better understanding of the culture and social values of learners. However, other games such as field games, track games which were not often used by teachers as revealed in their responses may be due to the fact that some of these games consume time and energy. School administrators and technologists therefore need to make effort to ensure that the types of games developed for teaching and learning are flexible to use. Relevant resources that will support the use of these different types of games for instructional delivery must also be provided in the school for both teachers and students.

5.3 Design Principles Engaged by Teachers in the Gamification of Classroom Instructions for Secondary Education Goals Attainment in Rivers State

There are principles guiding the design of games which will be used for teaching and learning and it is only when these principles are adhered to that the goals of education can be achieved. The study summarily showed that the teachers do not really adhere to the principles of games design for instructional delivery. However, other studies such as that of Appiah (2015) indicated that teachers adhere to the design principles for gamification. The adherence to this principle is important for meaningful teaching and learning. Teachers therefore need to be oriented about these principles and supported as much as possible to put these principles into practice for the goals of education to be achieved.

The teachers used for the study indicated from their responses that they adhere to the principle of using games to get feedbacks, arrange the complexity of learning as well as meet learning objectives. However, they disagreed that they adhere to the principle of using games with features that can be controlled by users. This is an issue that needs to

be resolved for optimal utilization of gamification. In their study, Hitchens and Tulloch (2017) found out that students found gamification useful and enjoyable when they are able to control the features of the game. Teachers therefore need to make conscious effort to ensure that games used for instructional delivery meet globally accepted principles for it to achieve relevant educational goals and objectives.

5.5 Approaches for Encouraging Gamification for Secondary Education Goals Attainment in Rivers State

The study showed that teachers sampled for the study disagreed on the approaches used for encouraging gamification in the school. This finding does not agree with the outcome of the study carried out by Cahyani (2016) which revealed that participants agreed that they engaged the approaches for gamification to a large extent. It was revealed that the respondents consider the characteristics of learners in the process of gamification as well as use games for specific learning objectives. However, other approaches were not properly enforced as expected. This suggests the need for teachers to comply with and engage relevant gamification approaches for the goals of secondary education to be achieved.

On their part, Antonaci, Klemke and Specht (2019) pointed out from the findings of their study that there is no sufficient empirical evidence on the approaches for gamification. This lack of relevant empirical evidence may explain why teachers have not been able to fully engage the approached for gamification. It is therefore important for more study to be carried out on the approaches for engaging gamification. This will help expose teachers to more approaches that can be engaged in gamification for the goals and objectives of education to be achieved.

5.6 Challenges in the Gamification of Classroom Instruction for Secondary Education Goals Attainment in Rivers State

Teachers sampled for the study revealed were able to establish that they agreed on the challenges to gamification of classroom instructions for the attainment of the goals of secondary education. The male and female teachers agreed that shortage of game resources, flexibility of usage as well as the side effects of some of these games make it difficult for some teachers to engage in the use of games for teaching and learning. The reason for this may be related with the outcome of the study conducted by Gafni, Achituv, Eidelman and Chatsky (2018) which showed that gamification does not meet the personality of some teachers and learners and this explains why they are not regularly used in the classroom.

The enforcement of gamification in classroom teaching and learning require a high level of commitment from teachers and students. The government, school administrators, teachers and students therefore have a lot of role to play in the process of gamification of classroom instruction. It is therefore important for all educational stakeholders to be committed to the gamification process for the goals and objectives of education to be achieved at the secondary level in Rivers State.

6. Conclusion

The following conclusion was made based on the findings of the study: teachers in secondary schools in Rivers State have the right perception about gamification and also engaged the use of computer games but did not adopt the right approaches and design principles in the process of gamification. This may account for the delay in the attainment of the goals of secondary education in Rivers State.

6.1 Recommendations

In line with the findings of the study, the following recommendations were made:

- 1) There is need for teachers in secondary schools in Rivers State to be engaged in regular training programmes where modern games and techniques of utilizing them can be introduced to these teachers. This will help to improve the skills and knowledge of these teachers in the gamification process for the goals and objectives of education at this level to be achieved.
- 2) The overdependence on computer games can jeopardize the attainment of some educational goals and objectives. The school curriculum therefore needs to be reformed to accommodate other type of games and policies should be instituted in the school to compel teachers to utilize these varieties of games.
- 3) Teachers should ensure that they engage their students in the selection of games for different lessons. This will help to ensure that the gaming approach used in the classroom meets the educational needs of the students as well as contribute to the attainment of the needed skills and knowledge.
- 4) School administrators should make effort to engage technological experts in the school who will enable these teachers to adhere to the professional principles of gamification. These experts will also help to provide assistance to the teachers in areas of difficult when games are being used for teaching in the classroom for the goals of education to be achieved.
- 5) The government as well as school administrators must make every effort to provide the right quality and quantity of games for teachers and students and this will go a long way to ensure that meaningful teaching and learning takes place across all levels in the school.

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